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Joseph J. Crimaldi
Roetzel & Andress
222 S. Main St.
Akron, OH 44308

| EXAMINER | |
|---|---|
| VIJAYAKUMAR, KALLAMBELLA M | |
| ART UNIT | PAPER NUMBER |
| 1793 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/566,339 | CAKMAK ET AL. | |
| | Examiner | Art Unit | |
| | KALLAMBELLA VIJAYAKUMAR | 1793 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *27 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/GB/08) Paper No(s)/Mail Date *03/28/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

- This is 371 of PCT/US 2004/024527 filed 29 July 2004 and claims priority over US Provisional 60/490,871 filed 29 July 2003.
- Claims 1-12 are currently pending with the application.
- The examiner has considered the IDS filed 03/28/2006.

### *Claim Rejections - 35 USC § 102*

### *Claim Rejections - 35 USC § 103*

- The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

- The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**1.** Claims 1, 3, 5-7, 9 and 11-12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kawata et al (US 5,512,399).

Kawata et al teach the composition and method of making a supporting layer with a volume resistivity of $10^4$ ohm.cm containing uniform dispersion of conductive carbon black (CB) nanoparticles in polyphenylenesulfide type resin (PPS) (Abstract; Cl-2, Ln 51-Cl-3, Ln 10; Cl-4, Ln 38-48; Cl-8, Table 2-3). The uniform dispersion of CB in the polymer matrix was attained with the aid of calcium carbonate or clay particles as dispersants. The prior art teaches varying the component ratios wherein the amount of CB was about 20 wt% or less and the preferred amount of dispersant ranged from about 10 to about 30 wt% in the composition (Cl-4, Ln 24-48). The amount of PPS was at least 40 wt% or more (Cl-5, Ln 4-8). Ref to properties/ characteristics in claims, the uniform dispersion of carbon black in a polymeric matrix aided by the clay dispersant establishes the dimensional conductive network of interparticle contact, and inherently has lower percolation threshold for the conductive agent, because the prior art composition contains same components as claimed/taught by the applicants and it is either same or substantially same as that claimed by the applicants, and Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by

identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. <MPEP 2112.01[R3]-I>.

Referring to the method claim-12, Kawata identifies the desired target resistivity for the support member, adds a definite amount of dispersant and carbon black to the polymeric composition, blend the component mixture and form the product with controlled uniform distribution of conductive agent in the matrix resulting in desired resistivity and properties. All the limitations of the instant claims are met.

In the alternative that the disclosure by Kawata et al be insufficient to anticipate the instant claims, nonetheless it would have been obvious to a person of ordinary skilled in the art to vary the component ratios in the composition and process of Kawata as proportional balancing of parameters to attain desired conductivity and properties over the prior art disclosure because the reference teaches each of the claimed ingredients within the composition, varying their ratios and a method of making it. The burden is upon the applicant to prove otherwise. In re Fitzgerald, 619 F.2d 67, 205 USPQ594 (CCPA 1980) [MPEP 2112 [R-3-V].

**2.** Claims 1-7, 9 and 11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Creehan (US 5,445,327).

Creehan teaches a composite containing one or more fillers uniformly dispersed in a matrix material wherein the fillers had been subjected to high shearing forces in presence of viscosity modifiers resulting in reduced size for agglomerates of the fillers and tailored uniform distribution throughout the matrix establishing conductive network (Abstract; Cl-1, Ln 37-66; Cl-2, Ln 30-65; Cl-3, Ln 17-38; Cl-4, Ln 11-18). The exemplary fillers were carbon fibrils (nanotubes), carbon black, single crystal whiskers or a combination thereof (Cl-1, Ln 67-Cl-2, 22; Cl-3, Ln 40-59). The matrix polymers include thermoplastics such as PET, PEEK, PES, PEI, PA/Nylon and themosets such as phenolic, epoxy, polyimide, bismaleimide and thermosetting polyester (Cl-2, Ln 23-41). Creehan further teaches the co-dispersion of a variety of fillers with different diameter and/or shapes to attain good filler dispersion throughout the matrix tailored to particular application (Cl-2, Ln 51-65).

Ref to properties/characteristics in claims, the uniform dispersion of conductive particles in a polymeric matrix establishes the three dimensional conductive network of intraparticle

contact (Cl-4, Ln 12-19), and inherently has lower percolation threshold for the conductive agent, because the prior art composition contains same components as claimed/taught by the applicants and it is either same or substantially same as that claimed by the applicants, and Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. <MPEP 2112.01[R3]-I>. All the limitations of the instant claims are met.

In the alternative that the disclosure by Creehan et al be insufficient to anticipate the instant claims, it would have been obvious to a person of ordinary skilled in the art to vary the particle size and process parameters in the process of Creehan as proportional balancing to attain desired electrical and optical properties over the prior art disclosure because the reference teaches each of the claimed ingredients within the composition and method of making it. The burden is upon the applicant to prove otherwise. In re Fitzgerald, 619 F.2d 67, 205 USPQ594 (CCPA 1980) [MPEP 2112 [R-3-V].

**3.** Claims 1-5 are rejected under 35 U.S.C. 102(a/e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chacko (US 2003/0100653).

Chacko teaches a polymeric thick film composition exhibiting homogeneous surface electrical characteristics and containing low volume fraction of fibers, comprising a dispersion of conductive particles and nanoparticles such as carbon black, carbon nanotubes, nanoclay, molecular silica nanoparticles or combinations thereof, in a polymer matrix such as polyamide imide, polyamide, phenoxy and epoxy [Abstract; 0004, 0010, 0012-0013, 0021-0023; 0028-0031; 0035-37, 0039-0067 and Examples]. The composition further contained surfactants and rheological additives. The resistive polymeric thick film was made by milling the components in a high shearing mill forming a dispersion and coating the dispersion over a substrate [0035-37]. The dispersion of the fillers throughout the matrix of the thick film is anticipated over the high shear milling of the multi-component mixture to desired particle size [See Rejections 1 and 2 above and not relied upon], and the uniform homogeneous thick film formed by screen-printing. All the limitations of the instant claims are met.

In the alternative that the disclosure by Chacko be insufficient to anticipate the instant claims, it would have been obvious to a person of ordinary skilled in the art to vary the components and their ratios in the composition and process of Chacko as proportional balancing of components to attain desired conductivity over the prior art disclosure because the reference teaches each of the claimed ingredients within the composition, varying their ratios and a method of making it. The burden is upon the applicant to prove otherwise. In re Fitzgerald, 619 F.2d 67, 205 USPQ594 (CCPA 1980) [MPEP 2112 [R-3-V].

**4.** Claims 6-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chacko (US 2003/0100653).

The disclosure on the composite composition by Chacko as set forth in Rejection-**3** is herein incorporated.

Chacko fails to teach the characteristics per the claims 6, 9, 10 and 11.

However, Chacko teaches polymeric thick film with uniform surface conductivity and enhanced mechanical and thermal properties obtained by varying the component ratios that includes nanoclays and/or molecular silica resulting in minimum use of conductive fibers i.e. improved conductivity with lowered nanotubes <percolation>. So it would have been obvious to a person of ordinary skilled in the art to optimize the components and their ratios in the composition of Chacko to attain desired properties with reasonable expectation of success, wherein the prior art composition is similar to that claimed by the applicants containing the same components, and similar compositions are expected to possess similar properties. <MPEP 2112.01[R3]-I>.

Ref method claim-12, Chacko teaches making a resistive element by milling the components, coating the surface and curing the film. The identification/target of the conductivity/resistivity in a resistive element would be obvious.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Shibuta (US 5,908,585) has not been used in the present action as multiple to the above rejections.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KALLAMBELLA VIJAYAKUMAR whose telephone number is (571)272-1324. The examiner can normally be reached on M-F 07-3.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 5712721358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KMV/
May 18, 2010.

/Stanley Silverman/
Supervisory Patent Examiner, Art Unit 1793